

High Power Infrared Emitting Diode, 850 nm, Surface Emitter Technology



21783

DESCRIPTION

VSMY7850X01 is an infrared, 850 nm emitting diode based on surface emitter technology with high radiant power and high speed, molded in low thermal resistance Little Star package. A 42 mil chip provides outstanding low forward voltage and allows DC operation of the device up to 1 A.

FEATURES

- Package type: surface mount
- Package form: Little Star®
- Dimensions (L x W x H in mm): 6.0 x 7.0 x 1.5
- Peak wavelength: $\lambda_p = 850$ nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity: $\phi = \pm 60^\circ$
- Low forward voltage
- Designed for high drive currents: up to 1 A DC and up to 5 A pulses
- Low thermal resistance: $R_{thJP} = 10$ K/W
- Floor life: 4 weeks, MSL 2a, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

 AUTOMOTIVE
GRADE

RoHS
COMPLIANT

APPLICATIONS

- Infrared illumination for CMOS cameras (CCTV)
- Driver assistance systems
- Machine vision IR data transmission
- 3D TV

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	ϕ (deg)	λ_p (nm)	t_r (ns)
VSMY7850X01	170	± 60	850	20

Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMY7850X01-GS08	Tape and reel	MOQ: 2000 pcs, 2000 pcs/reel	Little Star

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	5	V
Forward current		I_F	1	A
Peak forward current	$t_p/T = 0.5, t_p = 100 \mu\text{s}$	I_{FM}	2	A
Surge forward current	$t_p = 100 \mu\text{s}$	I_{FSM}	5	A
Power dissipation		P_V	2.5	W
Junction temperature		T_j	125	$^\circ\text{C}$
Operating temperature range		T_{amb}	- 40 to + 100	$^\circ\text{C}$
Storage temperature range		T_{stg}	- 40 to + 100	$^\circ\text{C}$
Soldering temperature	Acc. figure 7, J-STD-20	T_{sd}	260	$^\circ\text{C}$
Thermal resistance junction/pin	Acc. J-STD-051, soldered on PCB	R_{thJP}	10	K/W

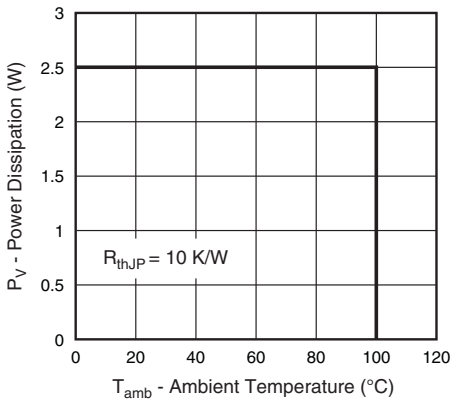


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

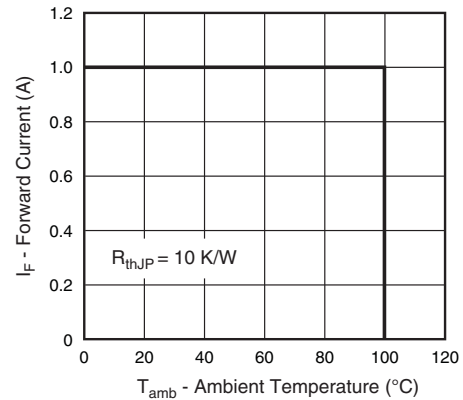


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 1\text{ A}$, $t_p = 20\text{ ms}$	V_F		2.0	2.5	V
	$I_F = 5\text{ A}$, $t_p = 100\text{ }\mu\text{s}$	V_F		3.5		V
Temperature coefficient of V_F	$I_F = 1\text{ A}$	TK_{V_F}		- 0.2		mV/K
Reverse current	$V_R = 5\text{ V}$	I_R	not designed for reverse operation			μA
Radiant intensity	$I_F = 1\text{ A}$, $t_p = 20\text{ ms}$	I_e	130	170	390	mW/sr
	$I_F = 5\text{ A}$, $t_p = 100\text{ }\mu\text{s}$	I_e		780		mW/sr
Radiant power	$I_F = 1\text{ A}$, $t_p = 20\text{ ms}$	ϕ_e		520		mW
Temperature coefficient of ϕ_e	$I_F = 1\text{ A}$	TK_{ϕ_e}		- 0.5		%/K
Angle of half intensity		φ		± 60		deg
Peak wavelength	$I_F = 1\text{ A}$	λ_p		850		nm
Spectral bandwidth	$I_F = 1\text{ A}$	$\Delta\lambda$		30		nm
Temperature coefficient of λ_p	$I_F = 1\text{ A}$	TK_{λ_p}		0.2		nm/K
Rise time	$I_F = 1\text{ A}$	t_r		15		ns
Fall time	$I_F = 1\text{ A}$	t_f		18		ns

BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

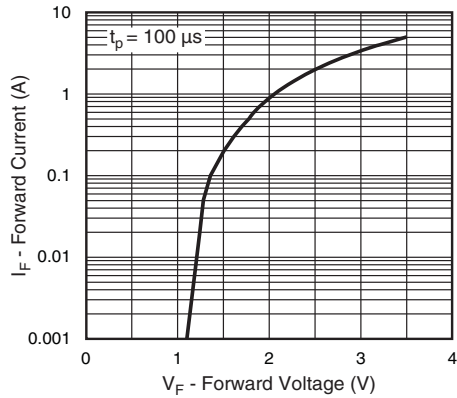


Fig. 3 - Forward Current vs. Forward Voltage

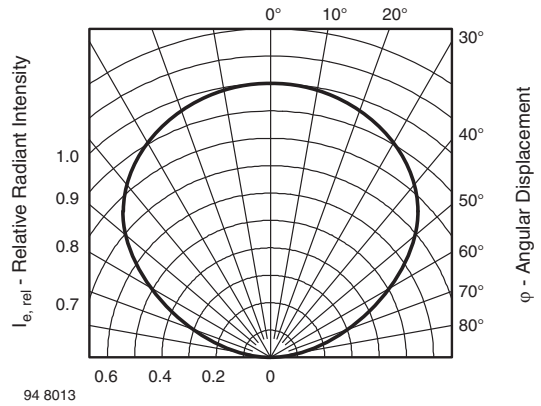


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

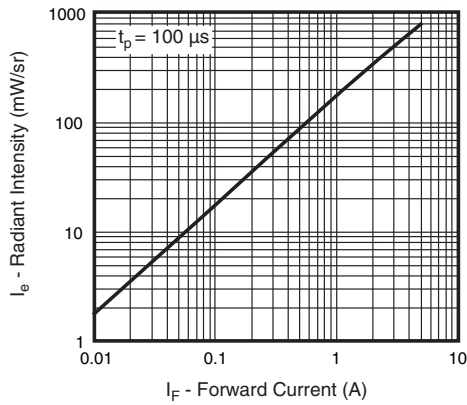


Fig. 4 - Radiant Intensity vs. Forward Current

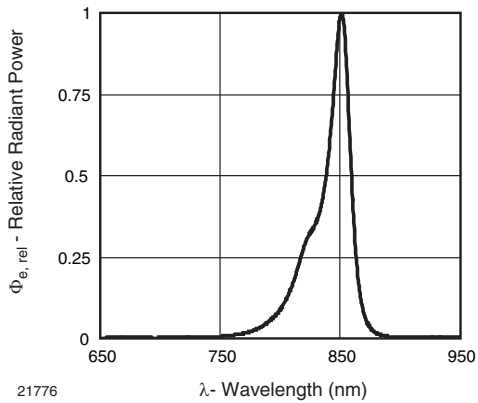


Fig. 5 - Relative Radiant Power vs. Wavelength

SOLDER PROFILE

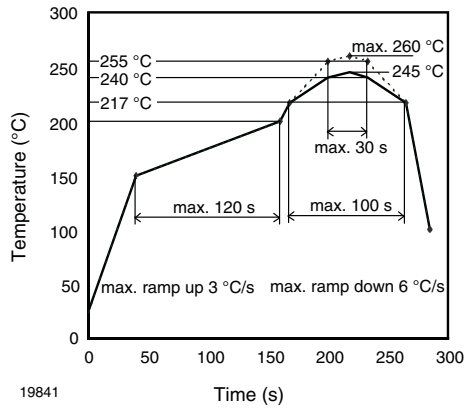


Fig. 7 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020 for Preconditioning acc. to JEDEC, Level 2a

DRYPACK

Devices are packed in moisture barrier bags (MBB) to prevent the products from moisture absorption during transportation and storage. Each bag contains a desiccant.

FLOOR LIFE

Floor life (time between soldering and removing from MBB) must not exceed the time indicated on MBB label:

Floor life: 4 weeks

Conditions: $T_{amb} < 30\text{ °C}$, $RH < 60\%$

Moisture sensitivity level 2a, acc. to J-STD-020B

DRYING

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at 40 °C (+ 5 °C), $RH < 5\%$.



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